3-1918

Circular No. 30 - The Codling Moth (*Carpocapsa pomonella* L.)

Harold R. Hagan

THE CODLING MOTH

(Carpocapsa pomonella L.)

By HAROLD R. HAGAN

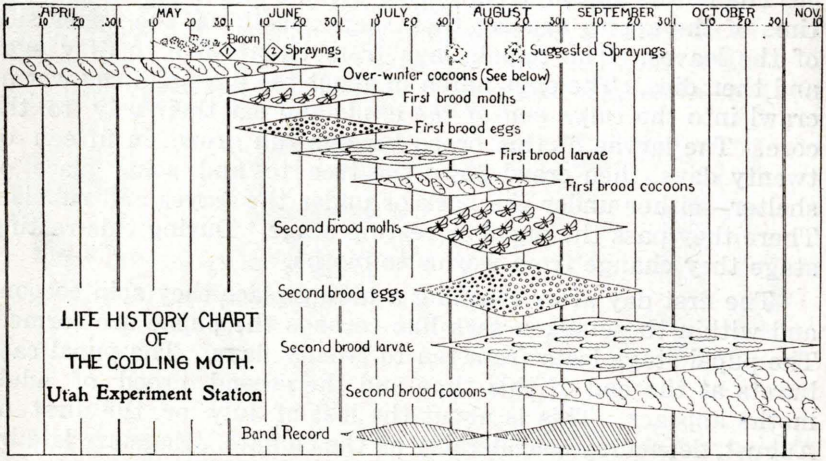


Chart showing life history of the codling moth with suggested times of banding and spraying.

CIRCULAR NO. 30

Utah Agricultural College

EXPERIMENT STATION

Logan, Utah **March, 1918**

THE CODLING MOTH

(Carpocapsa pomonella L.)

By HAROLD R. HAGAN

The Utah Experiment Station bulletins originally published, outlining satisfactory methods for reducing injury by the codling moth, are no longer available for distribution. This circular contains in briefer form the essential information for controlling the pest.

LIFE HISTORY

The moths appear from one to three weeks after blossoming time of the apples and lay their eggs usually on the upper side of the leaves. The female lays from twenty-five to fifty eggs and then dies. The eggs hatch in about ten days and the worms crawl into the *calyx end of the apple* and eat their way to the core. The larvae of this brood become full grown in fifteen or twenty days, then crawl down the tree to find some place of shelter—either under the bark or under the leaves and rubbish. There they pass the pupal or resting stage. During this resting stage they change from worms to moths.

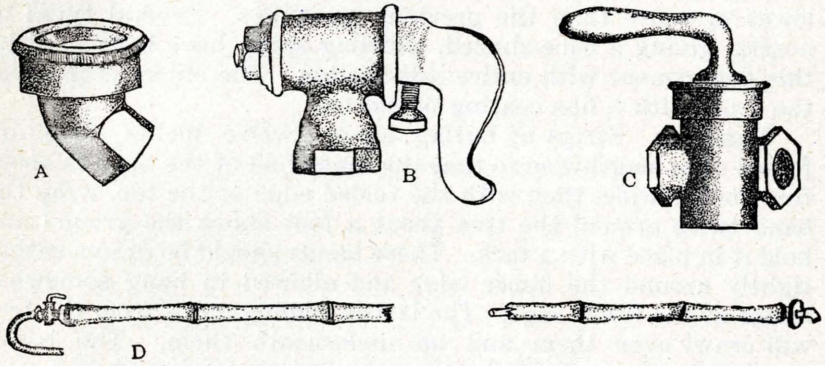
The first day after reaching a hiding place they spin cocoons and within these silken sack-like cocoons the pupae are formed. The pupal stage lasts from ten to twenty days. The pupal case bursts at the end of this time and the second brood of adult moths appears. This is about the last of July or the first of August, depending considerably on the climate. Eggs are laid by this brood all during the month of August. It takes, on an average, seven days for the eggs to hatch at this time of the year. The worms hatching from these eggs bore into the side of the fruit and eat the pulp, usually penetrating to the core. They become full grown in twenty days, then seek shelter under rough bark, bands, or rubbish to pass the winter.

As soon as a shelter is found they spin cocoons and remain as larvae over winter in these retreats. Just before blooming time next spring these larvae change to pupae and in about three weeks the adult moths come forth from the pupae. This in brief is the life cycle of the codling moth. (See chart on the cover.)

CONTROL MEASURES

Spraying: In controlling the codling moth the most important feature of the work is to apply an efficient spray at the right time. A first-class pump maintaining a pressure of about 150 pounds is necessary. A hand pump may suffice for a very small orchard, but for a large orchard a power outfit is imperative. Spraying should be done from the top of a scaffold or ladder so that the man doing the spraying is a little above the center of

the tree. Generally the blossoms all point outward; therefore, the spray should be driven down from the top, in from the side, and up from the bottom of the tree. The hose should be long enough to do the work readily and strong enough to stand the pressure. It is best to use a seven-ply hose. The spray rod should be a ten-foot bamboo pole. It should be fitted with a cut-off valve at the base and with a drip ring and 45 degree angle at the nozzle end. (See Figure). The cut-off should be used to save spray material while passing from tree to tree. The nozzle for the early spraying should be one that gives a driving, fan-like spray, which will not break into a mist until it has left the nozzle for at least five feet. The spray used is arsenate of lead —about three pounds of paste or one and one-half pounds of powder to fifty gallons of water. Care must be taken to keep the



A, "Mistry" nozzle fitted with 45 degree angle; B, "Bordeaux" nozzle, the correct type of nozzle for the driving spray; C, Cut-off valve used to economize on spray; D, Section of spray rod showing attachment of hose, cut-off valve, brass or copper rod in the pole, drip ring and 45 degree angle ready for attachment of nozzle.

mixture constantly agitated so that the arsenate of lead will not settle to the bottom. The spray should be applied three to five days after the petals begin to fall, *with the sole object of filling each calyx cup with the poison.* It makes no difference if it touches the rest of the tree. "It is not a question of how much you spray, but of how well you spray."

A second spraying, similar to the first, should be applied ten days later. This will complete filling the calyx cups that are not open as early as the first spraying. These sprayings usually cannot be done at one time as a number of the cups are closed before others are open. If the calyx cup is closed it is too late to apply any spray for the first brood. In applying the spray, the outfit stops just before the men spraying the orchard reach a point opposite the center of the first trees of the first two rows.

Two men may apply the spray. They should spray the nearest third of the tree opposite them in the row, then they drive the outfit forward a few feet that they may spray the remainder of the first two trees and the first third of the second two trees. This method is continued until the end of the row is reached when the outfit is turned down the second row. Spray a third of the tree each time even if the sprayings overlap. It is poor economy to miss poisoning any calyx cups.

Inspection. Somewhat later an examination of the orchard will show whether ten per cent of the apples are wormy. If the spraying is done right there should not be ten per cent of wormy apples in the orchard. If there are more than this number, a third spraying should be applied about fifty days after the first brood of moths are thickest in the orchard, about the first of August. This should be a fine mist spray applied with a much lower pressure than the previous sprayings. Several types of nozzles giving a cone-shaped, whirling spray have been used by this department with entire satisfaction. The object is to cover the fruit with a fine coating of poison.

Banding: Strips of burlap about twelve inches wide are folded once lengthwise so that the inner fold of the band is about four inches wide, then with the folded edge at the top, wrap the band twice around the tree about a foot above the ground and hold it in place with a tack. These bands should be drawn rather tightly around the upper edge and allowed to hang somewhat looser at the lower edge. The larvae coming down from the tree will crawl over them and up underneath them. The bands should be put on about the time the first few worms begin coming down from the tree (July first). This will be about twenty-five or thirty days after the eggs are laid for the first brood. The bands should be taken off and examined every seven or eight days and the bands should be replaced after each examination. All the first brood of worms come down by the last of August. All the worms under the bands should be killed. After August the bands may be left on until the apples are picked; then they should be taken off and all the late second brood worms found under them should be killed. The bands can now be put away for the winter.

Besides these methods of control, the orchardist should examine the rough bark of each tree and into all cracks and crevices to kill the larvae that may be hidden there. Old bark should be scraped from the tree as it will, if left on, afford protection for the worms. Birds, ants, beetles, and some parasitic bees prey upon the eggs and worms and assist in the natural means of control.